

	<b>INDIANA DEPARTMENT OF TRANSPORTATION</b> INTER-DEPARTMENT COMMUNICATION <i>Standards Section – Room N642</i>	
<i>Writer's Direct Line</i> 232-6775		

October 12, 2004

**DESIGN MEMORANDUM No. 04-10**  
**TECHNICAL ADVISORY**

**TO:** All Design, Operations, District Personnel, and Consultants

**FROM:** /s/ Anthony L. Uremovich  
Anthony L. Uremovich  
Design Policy Engineer  
Contracts and Construction Division

**SUBJECT:** Wingwalls and Headwalls for Precast Concrete Box Culverts

**COMPLEMENTS:** *Indiana Design Manual* Section 31-3.06

**EFFECTIVE:** January 19, 2005, Letting

Designing and detailing wingwalls and headwalls for most precast concrete box culverts will not be required. Such wingwalls and headwalls may be precast.

The information to be shown on the plans is as follows:

1. a plan view of the box culvert showing the total length of the culvert, skew angle, distance from roadway centerline to each end of culvert, and the flare angle of all wingwalls;
2. an elevation view of the end of the culvert including wingwalls and headwall if applicable. The span and rise of the culvert should be dimensioned. The heights of the headwalls should be shown;
3. wingwalls labeled A through D with a table showing all dimensions and elevations for each wingwall;

4. a table summarizing the wingwall areas required;
5. a typical section through the wingwall that shows the approximate footing configuration;  
and
6. the allowable soil bearing pressure. A table should be included, listing the soil parameters for wingwall design as follows:
  - a. angle of friction between wingwall footing and foundation soil ( $\delta$ );
  - b. angle of internal friction of the foundation soil ( $\phi$ );
  - c. ultimate cohesion of foundation soil (C); and
  - d. ultimate adhesion between foundation soil and concrete (CA).

These soil parameters will be provided in the Geotechnical Report for each box culvert. If the Geotechnical Report is lacking such information, it should be requested from the Materials and Tests Division's Geotechnical Section.

The wingwalls are a separate pay item, 714-06660, Wingwalls, pay unit square meter (square foot). The cost of the wingwall footing will be included in the cost of the wingwalls pay item. The cost of the headwalls will be included in the cost of the box culvert.

If a project has both reinforced concrete three-sided drainage structures and precast concrete box culverts with wingwalls, the wingwalls quantities for both types of structures may be combined in the cost estimate.

Recurring special provision 735-R-468, Wingwalls and Headwalls for Precast Concrete Box Culverts, should be called for if this work is to be included in the contract.